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ABSTRACT

This study was designed as a reconsideration of the weights used in evaluative decisions made with regard to research proposals submitted for funding at a major state university. The specific objective of the study was to determine whether the actual weights for components used in the evaluation of the proposals differed from a priori weights across application periods with evaluators and proposals varying. Faculty members submitted proposals to the grants-in-aid committee for possible funding. Working independently, each committee member rated each proposal on eight components: (1) significance of the research; (2) clarity and reasonableness of the objectives; (3) appropriateness of the methodology; (4) adequacy and clarity of the budget; (5) potential for future extramural support; (6) applicant's experience; (7) review of the related literature; and (8) consistency of proposed research with the applicant's educational background and experience. Maximum a priori weights were assigned to each component. Ratings were added to yield a total for each proposal. Statistical analysis showed that actual and a priori weights may differ across evaluators and across proposals. (MDE)

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# A Reconsideration of the Weights Applied in Evaluative Decisions

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A Reconsideration of the Weights

Applied in Evaluative Decisions

When evaluative decisions are made in a number of educational settings, one measure or score is often used. However, that value, more often than not, is a composite of a number of components.

The rationale for using the composite is a valid one: The total is a more reliable measure than any one of the component parts alone. Each of the components contributes to the total. However, the weighting of each part in the total is not readily apparent. Simply establishing an a priori weight for each component does not necessarily mean that the parts actually will be so weighted in the evaluative process. Halpin, Halpin, and Douglas (1982) found that the actual criteria weights being applied to the selection of candidates for membership in the National Honor Society differed substantially from the a priori weights. Because the total does depend upon the actual weight of its parts, persons who have to make decisions based on weighted totals might well need to study carefully how such weights operate (Doppelt, 1957).

This study was designed as a reconsideration of the weights used in evaluative decisions made with regard to research proposals submitted for funding at a major state university. The specific objective of the study was to determine if the actual

weights for components used in the evaluation of the proposals differed from a priori weights across application periods with evaluators and proposals varying.

## Method

Faculty members submitted research proposals to the university grant-in-aid committee for possible funding. The number of faculty members submitting proposals was 37, 35, 39, 39, and 38, respectively, over five application periods. The number of faculty members serving on the grant-in-aid committee evaluating the proposals was 7, 8, 7, 9, and 10 respectively.

Working independently, each committee member rated each proposal on eight components: significance of the research, clarity and reasonableness of the objectives, appropriateness of the methodology, adequacy and clarity of the budget, potential for future extramural support, applicant's experience, review of the related literature, and consistency of proposed research with the applicant's educational background and experience. The maximum a priori weights were 25, 10, 10, 10, 10, 15, 10, and 10 for each respective component. Ratings on each of the components were summed to yield a total for each proposal.

Classical test theory was utilized in determining the actual weights of the eight components. Accordingly, the reliability index for each component [product of the component standard deviation computed across raters and the component (average across

raters)/total (sum of average ratings across components) correlation] was divided by the standard deviation of the total to get the proportion of the total variability, in standard deviation units, accounted for by the component (cf. Allen & Yen, 1979). The analysis was repeated for each of the five application periods.

## Results

The actual weights for the components across the five application periods are given in Table 1.

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Insert Table 1 about here

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The range across applications for actual weights was .18/.25 for significance with a median of .23 and a priori weights of .25, .05/.08 for objectives with a median of .06 and a priori weight of .10, .05/.08 for methodology with a median of .07 and a priori weight of .10, .07/.12 for budget with a median of .07 and a priori weight of .10, .12/.30 for extramural support with a median of .19 and a priori weight of .10, .12/.30 for experience with a median of .20 and a priori weight of .15, .03/.09 for review of literature with a median of .07, and a priori weight of .10, and .06/.19 for research background with a median of .08 and a priori weight of .10.

## Conclusions

These results suggest that careful investigations of the weights actually being used in the evaluative process be made by all decision-makers basing selections on composites of component measures. That actual and a priori component weights may differ and that these differences are likely to be found across evaluators and across proposals are occurrences to be anticipated.

References

Allen, M. J., & Yen, W. M. (1979). Introduction to measurement theory. Monterey, CA: Brooks-Cole.

Doppelt, J. E. (1957, December). Watch your weights. Test Service Bulletin (No. 52, pp. 2-5). New York: Psychological Corporation.

Halpin, Gerald, Halpin, Glennelle, & Douglas, J. (1982, November). A study of the relative weights of components in selection decisions. Paper presented at the meeting of the Mid-South Educational Research Association, New Orleans, LA.

Table 1 (continued)

| Component | Mean | Standard Deviation | Component/ Total Correlation | Reliability Index | Weight |
|---|---|---|---|---|---|
| | | | Period 2 | | |
| Significance | 17.0000 | 1.5076 | .8901 | 1.3490 | .2205 |
| Objectives | 7.9451 | .5859 | .7639 | .4476 | .0732 |
| Methodology | 7.7839 | .5788 | .8520 | .4931 | .0806 |
| Budget | 7.4359 | .9821 | .7279 | .7149 | .1169 |
| Support | 6.7802 | 1.0053 | .7322 | .7361 | .1203 |
| Experience | 11.3443 | 2.1059 | .7573 | 1.5948 | .2607 |
| Literature | 8.1978 | .5480 | .7590 | .4159 | .0680 |
| Background | 8.3333 | .5517 | .6772 | .3736 | .0611 |
| Total | 74.8205 | 6.1187 | | | |



(table continues)

Table 1

Summary Statistics and Resulting Weights Across Application Periods

| Component | Mean | Standard Deviation | Component/ Total Correlation | Reliability Index | Weight |
|---|---|---|---|---|---|
| | | | Period 1 | | |
| Significance | 15.6679 | 1.8991 | .9058 | 1.7202 | .2339 |
| Objectives | 7.9000 | .6543 | .8587 | .5618 | .0764 |
| Methodology | 7.8500 | .7487 | .8105 | .6068 | .0825 |
| Budget | 7.4929 | 1.0365 | .5575 | .5778 | .0786 |
| Support | 6.5536 | 1.5557 | .9025 | 1.4040 | .1909 |
| Experience | 11.4607 | 1.9694 | .7282 | 1.4341 | .1950 |
| Literature | 8.1714 | .7098 | .7917 | .5619 | .0764 |
| Background | 8.000 | .6826 | .7148 | .4879 | .0664 |
| Total | 73.0964 | 7.3548 | | | |

(table continues)

Table 1 (continued)

| Component | Mean | Standard Deviation | Component/ Total Correlation | Reliability Index | Weight |
|---|---|---|---|---|---|
| | | | Period 3 | | |
| Significance | 14.8147 | 2.2393 | .6749 | 1.5113 | .1809 |
| Objectives | 7.9730 | .7165 | .6498 | .4656 | .0557 |
| Methodology | 7.9730 | .7758 | .6813 | .5288 | .0633 |
| Budget | 7.4015 | 1.3311 | .4089 | .5443 | .0651 |
| Support | 6.7413 | 3.0739 | .8158 | 2.5079 | .3002 |
| Experience | 11.2394 | 2.3496 | .4197 | .9861 | .1180 |
| Literature | 8.2355 | .5525 | .4267 | .2358 | .0275 |
| Background | 8.7297 | 2.8073 | .5612 | 1.5754 | .1886 |
| Total | 73.1081 | 8.3550 | | | |

(table continues)

Table 1 (continued)

| Component | Mean | Standard Deviation | Component/ Total Correlation | Reliability Index | Weight |
|---|---|---|---|---|---|
| | | | Period 4 | | |
| Significance | 15.3895 | 1.8544 | .8172 | 1.5154 | .2538 |
| Objectives | 8.2579 | .5622 | .5511 | .3098 | .0519 |
| Methodology | 8.0342 | .6317 | .6714 | .4241 | .0710 |
| Budget | 7.2974 | 1.0779 | .4108 | .4428 | .0742 |
| Support | 6.2974 | 1.4404 | .7859 | 1.1320 | .1896 |
| Experience | 10.4579 | 2.0846 | .5159 | 1.0754 | .1801 |
| Literature | 8.5500 | .7074 | .7370 | .5213 | .0873 |
| Background | 8.7105 | .7925 | .6948 | .5506 | .0922 |
| Total | 72.9947 | 5.9716 | | | |

(table continues)

Table 1 (continued)

| Component | Mean | Standard Deviation | Component/ Total Correlation | Reliability Index | Weight |
|---|---|---|---|---|---|
| | | | Period 5 | | |
| Significance | 16.0798 | 1.9376 | .8470 | 1.6410 | .2255 |
| Objectives | 8.4501 | .5205 | .7565 | .3940 | .0541 |
| Methodology | 8.2279 | .5694 | .6741 | .3840 | .0528 |
| Budget | 7.9202 | .9187 | .5338 | .4904 | .0674 |
| Support | 7.0142 | 1.2292 | .8104 | .9960 | .1369 |
| Experience | 10.7550 | 2.8260 | .7648 | 2.1613 | .2970 |
| Literature | 8.5071 | .8741 | .7360 | .6443 | .0885 |
| Background | 8.8063 | .8541 | .6636 | .5668 | .0779 |
| Total | 75.7607 | 7.2767 | | | |